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COOK / CHILL SPECIALISTS

June 22, 1999

Mr. Larry Franklin
JOHN MORRELL & CO.

Via Fax # 605-330-3167

RE: Quote # 765DH - Revised

RapidFlow Browning / Smoking Line Proposal

To achieve throughput of 380 pieces per hour, the following equipment be necessary:

Bag Stripper
Infra-Red Purge Removal
Auto Indexer
Liquid Smoke Applicator
2-Zone RapidFlow Oven
Impingement Chiller

ABOUT THE EQUIPMENT

Bag Stripper

The UNITHERM Bag Stripper, with two operators, can strip the casing from 10,000 lbs of hams per hour, compared to the ten to twelve people necessary to manually strip the casing from the same quantity of hams.

The first stage of the Bag Stripper washes the bag. Filtered compressed air is then injected into the casing, separating the casing from the product for easy removal. The product is then conveyed over a depth-controlled blade designed to follow the contour of the product, slitting

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the casing with minimal scoring of the product. The product is then conveyed to a casing removal station where the separated and slit casing is manually removed from the product. With hams of approximately 14-lb., this system can accommodate 12 to 15 hams per minute, for a total of 9,000 to 12,000 lbs per hour.

Infra-Red Purge Removal

The hams, with casings removed, would then be conveyed through a 1,200° F. chamber, melting off any remaining gelatinous purge and quickly drying the surface, within a one-minute dwell time. This dramatically improves adhesion of liquid smoke, resulting in more consistent color.

Auto Indexer

As products exit the purge remover, they are conveyed single-file onto the Auto Indexer, where they are transferred 90° and configured 4 or 5 across, maximizing usage of the 40"-wide belt common to the balance of the system.

Liquid Smoke Applicator

The liquid smoke application system is a recirculating loop in which the "smoke" is sprayed through a series of nozzles onto the product, recovered in a sump below, filtered, and then re-directed to the nozzles. This system exposes all of the product to the same quantity of "smoke", for the same dwell time, creating a uniform surface for the RapidFlow Oven. Dwell time is typically 60 seconds, although this may vary with different smoke combination and various products.

The liquid smoke solution is a mixture of liquid smoke and water, the concentration depending on the desired color of the finished product. Contributing to the overall cost savings associated with this process is the fact that the smoke solution may be retained for up to 7 days, provided that the pH of the solution remains below pH4 and the total acidity remains above 1%. The solution must also be free of all visible particles of meat.

At day's end, the liquid smoke may be pumped into a storage tank for reuse. This is accomplished using the system's main pump, by closing the valve to the nozzles and opening the valve to the storage tanks. The system can be easily washed out with the main drain valve open.

The system uses a dual in-line filter assembly, virtually eliminating clogged filter problems. The valve to the first filter may be closed and the valve to the second filter opened so that production can continue.

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RapidFlow II Continuous Convection Oven

Product is automatically transferred from the Liquid Smoke Applicator into the RapidFlow Oven, typically 4 or 5 pieces across. The high-velocity, high-temperature air quickly raises the surface temperature of the product, causing the liquid smoke to react with surface protein. Color formation appears on the product, and the heat sets the color via the Maillard reaction. Because only the surface temperature is affected by this process, only a minimal cooling period is required before the product can be packaged.

Smoking and browning applications generally take from 6 to 10 minutes. By adjusting dwell time with belt speed and adjusting temperature, you can achieve the degree of color you require. Naturally-browned product requires between 11½ and 18 minutes, subject to formulation and color requirement.

Utilizing a 2-speed motor coupled with an inverter, a wide range of speed control is available. Temperature is controlled independently for each zone from 0° F. to 650° F. In a multi-zone application, airflow is generally in opposite directions for each zone, to achieve the uniform results for which the RapidFlow Oven has become known.

This oven comes equipped with a continuous belt washer, available steam for varied cooking conditions, and an automatic solid state fire suppression system. An optional fully-automatic Clean In Place (C.I.P.) System is available and highly recommended.

Continuous Linear Impingement Chiller

UNITHERM Impingement Chillers have been designed to complement the RapidFlow Oven. The Chillers utilize the same 40"-wide belt for ease of transfer and labor-free operation. A naturally browned product exits our RapidFlow Oven at a surface temperature of between 120° F. and 130° F., and can be chilled to approximately 40° F. in 20 minutes or less.

UNITHERM is prepared to guarantee the performance of this system.

In summary, the turnkey RapidFlow Process consists of a Bag Stripper, Infra-Red Purge Removal, Liquid Smoke Applicator, RapidFlow II Continuous Convection Oven, and Continuous Linear Impingement Chiller. One of the most significant benefits associated with this system is an increase in yield, since yield loss through processing is reduced to a maximum of 2%. This saving alone can show a return on investment in a very short period of time. In addition, this system reduces overall processing time, allowing increased volume, which translates to increased profits. Labor costs are reduced, as well, since the process is continuous, and less handling can result in increased product shelf life.

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TECHNICAL SPECIFICATIONS**UNITHERM Bag Slitter**

Belt Height:	40" with adjustable feet +/- 6"
Belt Width:	21" with adjustable guide rails
Belt Type:	Intralox dual 10" belts
Overall Length:	12'
Overall Width:	2'-10½"
Belt Speed:	Variable through inverter from 15 to 20 pieces per minute.
Conveyor Motor:	Sew Eurodrive washdown rated for extreme environments; dual voltage 220 / 460 v 3 ph. 60 hz.
Safety Specifications:	Emergency stop on each end of conveyor, emergency stop on control panel with lock-out on main switch. Overhead guard switch stops system automatically if guard is lifted during operation.
Sanitizing Pump:	Dual-diaphragm recirculating pneumatic at 80 p.s.i., supplies sanitizing spray to main spray head and to cutting assembly.
Control Panel:	System start / stop System reset Sanitizer on / off Main power on / off (lockable) Emergency stop All timing and speed controls mounted inside cabinet to prevent tampering

UNITHERM Infra-Red Purge Removal

Belt Height:	40" with adjustable feet +/- 6"
Belt Width:	11"

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Belt Type:	Flat flex stainless steel wire belt
Footprint:	7' overall length × 28" overall width
Belt Speed:	Variable through inverter; dwell time from 15 seconds to 5 minutes. Dwell time of 45 seconds recommended, resulting in 10 pieces per minute or 6,000 lbs per hour.
Heating System:	Comprised of 18 × 1kW incoloy elements, designed to maximize heat transfer; total heating load 18 kW.
Exhaust System:	Supplied with exhaust cabinets over infeed and discharge, with 8" 10-bolt flange ready to connect to "house" exhaust system.
Belt Speed:	Variable; with standard 2-speed motor coupled with supplied inverter, dwell times can be adjusted from 15 seconds to 5 minutes.
Motor:	2-speed washdown rated for extreme environments; dual voltage 220 / 460 v 3 ph 60 hz.
Belt Washer:	Equipped with continuous belt washer, high pressure at 125 p.s.i. with adjustable weir plate to regulate water usage. Pump close coupled to 5 hp motor.
Control Panel:	Zone 1 heaters on / off Zone 2 heaters on / off Zone 3 heaters on / off Belt drive off / slow / fast Extraction system on / off Main power on / off (lockable) Emergency stop Panel-mounted inverter for easy speed adjustment.
General Construction:	304 stainless steel throughout; main framework of 1½" × 1½" heavy-wall square tube; inner cabinet of mirror-finish 16 gauge 304 stainless steel, insulated from outer cabinet with extreme-high-temperature insulation for heat retention and safety. One 3"-diameter open drain in the bottom prevents accumulation of melted purge. Belt support rods and interior drip pan easily removed for sanitation.

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UNITHERM Liquid Smoke Applicator

Belt Height:	40" with adjustable feet +/- 6"
Belt Width:	40"
Belt Type:	Flat flex stainless steel wire belt
Overall Length:	8'-8"
Overall Width:	5'-7¼"
Belt Speed:	Variable; through supplied inverter, dwell times can be adjusted from 30 seconds to 5 minutes.
Conveyor Motor:	Sew Eurodrive single speed; dual voltage 220/460 v 3 ph 60 hz.
Circulation Pump:	Dual-diaphragm recirculating, using 80 p.s.i. air
Control Panel:	Belt on / off Pump on / off Exhaust on / off Main power on / off (lockable) Inverter mounted internally to prevent tampering.
General Construction:	304 stainless steel and food-grade polymers throughout. Framework of 1½" x 1½" 304 stainless steel square tube; tank of 14 gauge 304 stainless steel; housing and canopy of 16 gauge stainless steel; all pipework from pump is schedule 40, 304 stainless steel. Fittings in header allow for easy nozzle change, if desired. Dual-filter system designed to prevent nozzle clogging.

UNITHERM Rapidflow II Continuous Convection Oven - Two-Zone

Belt Height:	40"
Belt Width:	40"
Belt Type:	Flat flex stainless steel wire belt
Overall Length:	20'

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Cooking Length:	17'
Drive Motors:	One Sew Eurodrive (1.3kW) washdown rated for extreme environments
Belt Speed:	2 minute minimum; 4 hour maximum
Circulation Fans:	Six with stainless steel impeller (6 × 0.75 kW), balanced by UNITHERM to provide even heat across entire belt width.
Steam Injection System:	Into cooking chamber. Nominally 160 lbs per hour maximum at 30 p.s.i. dry saturated. (Independently controllable.)
Extraction Fan:	Two bifurcated 2000 cfm variable (0.75kW), stainless steel construction.
Continuous Belt Washer:	Continuous high-pressure steam coupled with dual stainless steel brushes.
Heating System:	<p>Comprised of 48 × 2 kW finned incoloy elements per zone. Elements designed to maximize efficient heat transfer, 192 kW total heating load.</p> <p>Elements controlled via electronic thyristor drive to maximize energy efficiency. To maximize start-up time, full energy usage allows the oven to reach maximum temperature (650° F.) within 15 minutes from cold. PID temperature controllers within each zone allow accurate set point control of +/- 2° F.</p>
Fire Protection Systems:	Operated by a solid-state, approved fire detector. Twin systems, steam at nominally 80 p.s.i. to flood the lower chamber and cooking area. Pressure switches ensure pressure available to allow machine to operate.
General Construction:	<p>All AISI 304 stainless steel. Main framework constructed of 1½" × 1½" 304 stainless steel square tube. Inner chamber allowed to "free float" for expansion purposes. Height adjustable, self-leveling feet. Outer canopies hinged to allow cleaning. All belt support rods are easily removed and refitted for sanitation.</p> <p>Fat collection tray in lower cooker chamber with 3"-diameter outfeed pipe to drain / collection system. Baffle plates on</p>

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circulation fans are removable for sanitation. All pipework has de-mountable fitting to allow hygiene.

Control Panel: Stainless steel NEMA 4X clear macrolon cover over door furniture and controllers. Visual display of temperature in each zone. Visual display of belt speed (frequency). General control gear Allen Bradley.

All Up Power Requirements:

Heating System:	192 kW
Circulation Fans:	4.5 kW
Extraction Fans:	3 kW
Controls, etc.	2 kW
Drive Motors:	<u>2 kW</u>
Total:	218.5 kW

Running Costs

During start-up (15 minutes), 100 percent power is required. During normal operation; the thyristor drive modulates the load to nominally 30 percent of the P.L.C.; this equates to 70 kW. Given an industrial cost per kWh of 7 cents, this gives a running cost of nominally \$4.90 per hour.

Costs of maintenance are minimal. A weekly check of all components will take one hour, due to the "Maintenance Friendly" design of the machine.

UNITHERM Linear Impingement Chiller

Features: Stainless steel evaporator coils
Heavy duty 6"-insulated food-safe encasement
Heavy duty stainless steel flooring with 6" insulation
Twin access doors with heated seal arrangement
Variable residence time
High airflow "tuned" to product requirements
Stainless steel product-conveyor belt
Stainless steel control panel
Defrosting control circuits

Encasement: Footprint 45' Overall length
10' Overall width
10' Maximum height

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Utilizing 6"-thick, food-safe polyurethane-insulated panels
 Stainless steel cladding on floor, falling to a drainage outlet
 Twin access doors with heated seal arrangement
 Inlet and discharge apertures to suit product

Conveyor: 40" effective belt width
 Ashworth omniflex 1/4"-pitch belt with mesh overlay or similar
 F.D.A. approved

Evaporators: Four separate units:
 40 kW thermal duty at outfeed

General construction:
 Stainless steel with aluminum fins
 Ducted axial fans
 Coil and tray defrost heaters

	40 kW infeed
Air on Temp. ° C.	-17.1
Air off Temp. ° C.	-20
Refrigerant	nh ³
System	dx
Evap. temp. ° C.	-27
Air volume m ³ /s	10.97
Face velocity m/s	3
Face dimensions mm	1524 x 2400
Internal volume dm ³	120

Baffles: All stainless steel
 Designed to eliminate "short circuiting" of air flow
 Removable for cleaning

Belt washer: In-line, high pressure wash and dry

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Control panel: Stainless steel enclosure
 Control gear UL / FM approved
 Electronic variable speed controller
 Residence time indicator in min./sec.
 Temperature controller (PID)
 Defrost controls (hot gas, if required)

PRICING

(F.O.B. Ponca City, Oklahoma)

Bag Stripper	\$ 49,500
Infra-Red Purge Removal	\$ 48,000
Auto Indexer	\$ 37,500
Liquid Smoke Applicator	\$ 45,000
2-Zone RapidFlow Oven	\$325,000
Optional C.I.P. System	\$ 58,000
Linear Impingement Chiller	<u>\$250,000</u>
	\$813,000
Less discount:	<u><\$ 25,000></u>
Total Package Price	\$788,000

A recommended spares package valued at \$17,000.00 will be supplied at no additional cost.

COMMERCIAL NOTES

Installation

Time required for installation is dependent on adequate site preparation and availability of services. Installation is defined as the time required for physically assembling the unit, connecting it to required services, and ensuring its proper operation, prior to testing with product. Installation will be charged at \$45 per hour for mechanical and electrical work. Out-of-pocket expenses and hotels will be charged at cost or, if preferred, settled directly by the client.

In areas where locally licensed contractors and / or craftsmen are mandated by local codes, such tradesmen will be contracted by the customer and at his expense.

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Installation includes:

Mechanical erection and leveling
Electrical interconnection using stainless steel and flexible conduit
Functional testing of all systems
Fire suppression system testing

Exclusions

Civil engineering work
Ducting from top of extract fans through roof space
Service connections (mains, incomer, steam, water, drains)

Commissioning

Commissioning includes time required to operate the equipment with test product and to provide instruction to qualified personnel regarding operation and maintenance of the equipment. The customer will be responsible for providing adequate product for test purposes, with the understanding that some of the resulting test product may be "Grade B", sacrificial. Commissioning is charged at \$45 per hour plus hotel and out-of-pocket expenses.

Documentation

Machine will be supplied with one full instruction manual including electrical drawings.

Delivery Lead Time

12 - 14 weeks from receipt of confirmed order and deposit.

Payment Terms

30% Deposit with purchase order
60% Prior to shipment, upon inspection at UNITHERM premises
10% Due 30 days after completion of installation

UNITHERM STANDARD TERMS AND CONDITIONS OF SALE APPLY

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